

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An integrated process for the conversion of feedstocks containing coal into liquid products by ~~the joint use of~~ jointly using at least the following seven process units: coal liquefaction (CL), flash or distillation of the product obtained from the liquefaction (F), extraction with a solvent to remove the ashes (SDAsh), distillation to separate the solvent (RS), hydroconversion with catalysts in slurry phase (HT), distillation or flash of the product obtained from the hydroconversion (D), deasphalting with a solvent (SDA), ~~characterized in that it comprises the following steps~~ comprising the steps of:

[[•]] 1. sending the feedstock containing coal to one or more direct coal liquefaction steps (CL) in the presence of a ~~suitable~~ hydrogenation catalyst;

[[•]] 2. sending the stream containing the product obtained from the coal liquefaction reaction to one or more flash or distillation steps (F) obtaining a gaseous stream and a liquid stream;

[[•]] 3. sending the liquid stream to an extraction step with a solvent (SDAsh) whereby an insoluble stream is obtained, consisting essentially of the mineral matter present in the feedstock and non-reacted coal and a liquid stream consisting essentially of the liquefied coal obtained and the solvent used;

[[•]] 4. sending the liquid stream consisting essentially of the liquefied coal and the solvent used to one or more distillation steps in order to substantially separate the solvent contained in the liquid stream, which is recycled to the extraction step with a solvent (SDAsh);

[[•]] 5. mixing the liquid stream substantially consisting essentially of the liquefied coal and at least part of the stream containing asphaltenes obtained in the deasphalting unit

with a ~~suitable~~ hydrogenation catalyst and sending the mixture obtained to a hydro-treatment reactor (HT) introducing hydrogen or a mixture of hydrogen and HZS therein;

[[•]] 6. sending the stream containing the reaction product of the hydro-treatment and the catalyst in dispersed phase to one or more distillation or flash steps (D) whereby the different fractions coming from the hydro-treatment reaction are separated;

[[•]] 7. sending at least part of the distillation residue (tar) or liquid leaving the flash unit, containing the catalyst in dispersed phase, rich in metal sulphides produced by the demetallation of the feedstock and optionally coke, to the deasphalting zone (SDA) in the presence of solvents, optionally also fed by at least one fraction of the liquid stream substantially consisting essentially of the liquefied coal, obtaining two streams, one ~~consisting stream~~ of deasphalted oil (DAO), the other ~~containing stream of~~ asphaltenes.

Claim 2 (Currently Amended): The process according to claim 1, wherein the feedstock containing coal ~~essentially consists~~ consisting essentially of coal.

Claim 3 (Currently Amended): The process according to claim 1, wherein the ~~suitable~~ hydrogenation catalyst present in the liquefaction step (CL) is at least partially recovered from the units downstream of said step 1.

Claim 4 (Currently Amended): The process according to claim 2, wherein the feedstock ~~essentially consisting~~ essentially of coal is slurried in a hydrocarbon matrix.

Claim 5 (Currently Amended): The process according to claim 4, wherein the hydrocarbon matrix ~~comes~~ is produced from the units downstream of the liquefaction step (CL).

Claim 6 (Currently Amended): The process according to claim 5, wherein the hydrocarbon matrix is part of the stream containing asphaltenes, as well as the dispersed catalyst used in the hydro-treatment step (HT), obtained in the deasphalting step (SDA) and/or part of the stream consisting essentially of deasphalted oil (DAO) obtained in the deasphalting step (SDA).

Claim 7 (Currently Amended): The process according to claim 1, wherein the direct liquefaction of the stream containing coal is effected by mixing said stream with an aromatic solvent in a quantity ranging from 20 to 80% with respect to the coal, and with a ~~suitable~~ catalyst in dispersed phase, operating at a temperature ranging from 360 to 440°C, at a hydrogen pressure ranging from 3 to 30 MPa and with residence times lower than or equal to 4 h.

Claim 8 (Currently Amended): The process according to claim 1, wherein part of the stream containing asphaltenes, as well as the catalyst used in the hydro-treatment step (HT), obtained in the deasphalting step (SDA) is added to the feedstock containing coal ~~to be~~ and sent to the liquefaction unit (CL) as solvent.

Claim 9 (Currently Amended): The process according to claim 1, wherein part of the stream consisting essentially of deasphalted oil (DAO) obtained in the deasphalting step (SDA) is added to the feedstock containing coal ~~to be~~ and sent to the liquefaction unit (CL) as solvent.

Claim 10 (Currently Amended): The process according to claim 1, wherein a part of the medium and heavy fractions (medium and heavy distillates) obtained in the distillation or flash unit (D) is added to the feedstock containing coal ~~to be~~ and sent to the liquefaction unit (CL) as solvent.

Claim 11 (Currently Amended): The process according to claim 1, wherein part of the solvent separated in the distillation step (RS) is added to the feedstock containing coal ~~to be~~ and sent to the liquefaction unit (CL) as solvent.

Claim 12 (Currently Amended): The process according to claim 1, wherein in the distillation step (RS) of the liquid stream consisting essentially of liquefied coal and the solvent used, a further stream is separated as distillate.

Claim 13 (Currently Amended): The process according to claim 12, wherein part of the further stream separated, as distillate, in the distillation step (RS) is added to the feedstock containing coal ~~to be~~ and sent to the liquefaction unit (CL) as solvent.

Claim 14 (Currently Amended): The process according to claim 1, wherein the direct liquefaction of the stream containing coal is effected by mixing said stream with an aromatic solvent in a quantity ranging from 20 to 80% with respect to the coal, and with a ~~suitable~~ catalyst in dispersed phase, operating at a temperature ranging from 360 to 440°C, a hydrogen pressure ranging from 3 to 30 MPa and with residence times lower than or equal to 4 h.

Claim 15 (Currently Amended): The process according to claim 1, wherein the extraction step with a solvent to remove the ashes is effected at a temperature ranging from 150 to 350°C and a pressure ranging from 20 to 60 atm in the presence of ~~a suitable~~ an aromatic solvent.

Claim 16 (Currently Amended): The process according to claim 1, wherein a heavy feedstock, selected from heavy crude oils, distillation residues, heavy oils coming from catalytic treatment, thermal tars, bitumens from oil sands, various types of coals and/or other high-boiling feedstocks of a hydrocarbon origin known as black oils, is added to the feedstock consisting essentially of coal ~~to be~~ and sent to the liquefaction unit (CL).

Claim 17 (Currently Amended): The process according to claim 1, wherein a heavy feedstock, selected from heavy crude oils, distillation residues, heavy oils coming from catalytic treatment, thermal tars, bitumens from oil sands, various types of coals and/or other high-boiling feedstocks of a hydrocarbon origin known as black oils, is added to the liquid stream consisting essentially of liquefied coal ~~to be~~ and sent to the hydro-treatment step (HT).

Claim 18 (Original): The process according to claim 1, wherein before being sent to one or more distillation or flash steps (D), the stream containing the hydro-treatment reaction product and the catalyst in dispersed phase, is subjected to a separation pre-step effected at high pressure in order to obtain a light fraction and a heavy fraction, said heavy fraction alone being sent to said distillation step(s) (D).

Claim 19 (Currently Amended): The process according to claim 18, wherein the light fraction obtained by ~~means of~~ the high pressure separation step is sent to a secondary post-

treatment hydrogenating section producing a lighter fraction containing C<sub>1</sub>-C<sub>4</sub> gas and H<sub>2</sub>S and a heavier fraction containing hydro-treated naphtha and gas oil.

Claim 20 (Original): The process according to claim 19, wherein the post-treatment hydrogenating reaction is effected at a pressure ranging from 7 to 14 MPa.

Claim 21 (Currently Amended): The process according to claim 1, wherein all the liquid stream ~~substantially~~ consisting essentially of liquefied coal is mixed with a suitable hydrogenation catalyst and sent to the hydro-treatment reactor (HT), whereas at least 600 of the stream containing asphaltenes, which also contains catalyst in dispersed phase and ~~possibly~~ coke and is enriched with metals coming from the initial feedstock, is recycled to the hydro-treatment zone.

Claim 22 (Original): The process according to claim 21, wherein at least 80% of the stream containing asphaltenes is recycled to the hydro-treatment zone.

Claim 23 (Currently Amended): The process according to claim 1, wherein the liquid stream ~~substantially~~ consisting essentially of liquefied coal and at least most of the stream containing asphaltenes, which also contains catalyst in dispersed phase and ~~possibly~~ coke, are mixed with a suitable hydrogenation catalyst and sent to the hydro-treatment reactor (HT).

Claim 24 (Original): The process according to claim 1, wherein part of the distillation residue (tar) or liquid leaving the flash unit (D) is sent to the deasphalting zone (SDA) and at least part of the remaining part of said distillation or flash residue is sent to the hydro-treatment reactor.

Claim 25 (Original): The process according to claim 24, wherein at least part of the remaining quantity of the distillation or flash residue (D) is sent to the hydro-treatment reactor together with at least part of the stream containing asphaltenes coming from the deasphalting section (SDA) .

Claim 26 (Original): The process according to claim 1, wherein at least 80% by weight of the distillation residue is sent to the deasphalting zone (SDA).

Claim 27 (Original): The process according to claim 26, wherein at least 95% by weight of the distillation residue is sent to the deasphalting zone (SDA).

Claim 28 (Original): The process according to claim 1, wherein at least part of the remaining quantity of distillation residue (tar), not sent to the deasphalting zone is recycled to the hydro-treatment section (HT).

Claim 29 (Original): The process according to claim 1, wherein the distillation steps are carried out at a reduced pressure ranging from 0.0001 to 0.5 MPa.

Claim 30 (Original): The process according to claim 29, wherein the distillation steps are carried out at a reduced pressure ranging from 0.001 to 0.3 MPa.

Claim 31 (Original): The process according to claim 1, wherein the hydro-treatment step is carried out at a temperature ranging from 370 to 480°C and at a pressure ranging from 3 to 30 MPa.

Claim 32 (Original): The process according to claim 31, wherein the hydro-treatment step is carried out at a temperature ranging from 380 to 440°C and at a pressure ranging from 10 to 20 MPa.

Claim 33 (Original): The process according to claim 1, wherein the deasphalting step is carried out at temperature ranging from 40 to 200°C and at a pressure ranging from 0.1 to 7 MPa.

Claim 34 (Original): The process according to claim 1, wherein the deasphalting solvent is a light paraffin with from 3 to 7 carbon atoms.

Claim 35 (Original): The process according to claim 1, wherein the deasphalting step (SDA) is carried out under subcritical or supercritical conditions with one or more steps.

Claim 36 (Currently Amended): The process according to claim 1, wherein the stream consisting essentially of deasphalted oil (DAO) is fractionated by ~~means of~~ ~~conventional~~ distillation.

Claim 37 (Currently Amended): The process according to claim 1, wherein the stream consisting essentially of deasphalted oil (DAO) is mixed with the products separated in the distillation step after being condensed.



Claim 38 (Original): The process according to claim 1, wherein the hydrogenation catalyst derives from a decomposable precursor or a preformed compound based on one or more transition metals.

Claim 39 (Original): The process according to claim 37, wherein the transition metal is molybdenum.

Claim 40 (Original): The process according to claim 1, wherein the concentration of the catalyst in the hydroconversion reactor, defined on the basis of the concentration of the metal or metals present, ranges from 300 to 20,000 ppm.

Claim 41 (Original): The process according to claim 40, wherein the concentration of the catalyst in the hydroconversion reactor ranges from 1,000 to 10,000 ppm.

Claim 42 (Currently Amended): The process according to claim 1, wherein a fraction of the stream containing asphaltenes, coming from the deasphalting section (SDA), called flushing stream, is sent to a treatment section with a ~~suited~~ suitable solvent for the separation of the product into a solid fraction and a liquid fraction from which said solvent ~~can be~~ is subsequently separated.

Claim 43 (Original): The process according to claim 42, wherein the flushing stream is in a quantity ranging from 0.5 to 10% by volume with respect to the fresh feedstock.

Claim 44 (Currently Amended): The process according to claim 43, wherein at least part of the liquid fraction deriving from the treatment section of the flushing stream is sent as

such or after being separated from the solvent and/or after the addition of a ~~suitable~~ fluxing agent to the Fuel Oil fraction.

Claim 45 (Currently Amended): The process according to claim 44, wherein at least part of the liquid fraction deriving from the treatment section of the flushing stream is recycled to the hydro-treatment reactor (HT) and/or at least ~~[[pat]]~~ part of the liquid fraction deriving from the treatment section of the flushing stream is recycled to the coal liquefaction unit (CL).

Claim 46 (Original): The process according to claim 42, wherein the solvent used in the treatment section of the flushing stream is an aromatic solvent or a mixture of gas oils produced in the process itself or available in refineries.

Claim 47 (Original): The process according to claim 46, wherein the aromatic solvent is toluene and/or a mixture of xylenes.

Claim 48 (Original): The process according to claim 40, wherein the volumetric ratio solvent/flushing stream varies from 1 to 10.

Claim 49 (Original): The process according to claim 48, wherein the volumetric ratio solvent/flushing stream varies from 1 to 5.

Claim 50 (Original): The process according to claim 49, wherein the volumetric ratio solvent/flushing stream varies from 1.5 to 3.5.

Claim 51 (Currently Amended): The process according to claim 38, ~~claims 42 and 38,~~ wherein the solid fraction of the product treated is sent to a further selective recovery treatment step of the transition metal or metals contained in the hydrogenation catalyst.

Claim 52 (Original): The process according to claim 51, wherein the transition metal or metals recovered are recycled to the hydro-treatment reactor (HT).